

Remarks

Claims 36-41, 57, and 64 are pending. Claim 63 has been cancelled. Claim 36 has been amended. Support for these amendments can be found in the specification on, for example page 29. No new matter has been added.

Appreciation is expressed for the telephonic interview conducted on December 2, 2003 between Examiner Curtis and Marc Ascolese, applicants' attorney. During the interview, independent claim 36 was discussed. While no agreement was reached during the interview, the undersigned believes this paper is in harmony with the positions expressed during the interview.

The applicants are mindful of the outstanding rejection of claims 36-41, 63, and 64 under 35 U.S.C. § 103(a) as being unpatentable over Newswanger, U.S. Patent No. 5,191,449 in view of Newswanger, U.S. Patent No. 5,291,317; and claim 57 under 35 U.S.C. § 102(b) as being anticipated by Newswanger '449. Although the applicants continue to submit that the Newswanger '449 and Newswanger '317 taken alone or in combination do not teach or suggest the limitations of claims 36-41, 63, and 64, as described below, the applicants have amended claim 36 in the interest of advancing prosecution of the present application.

Rejection of Claims under 35 U.S.C. § 103

Claims 36-41 and 64 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Newswanger '449 in view of Newswanger '317. The applicants respectfully traverse in part this rejection.

Newswanger '449 and Newswanger '317 neither teaches nor suggests an apparatus for printing holographic stereograms including:

an object beam unit, including a removable band-limited diffuser, for displaying a rendered image and for conditioning the object beam with the rendered image to interfere with the reference beam at a chosen elemental hologram, *wherein the removable band-limited diffuser includes a deterministic phase pattern designed to diffuse light in at least one of a specific pattern and a specific direction, and wherein the removable band-limited diffuser is designed for a wavelength corresponding to a wavelength of the coherent beam;*

a removable masking plate located in the path of the reference beam and proximate to the holographic recording material, *wherein the removable band-limited diffuser and the removable masking plate form a matched set configured to allow exposure of a particular size hogel; and*

a computer programmed to control the interference of the object beam and the reference beam and the delivery of the rendered image to the object beam unit,

as required by independent claim 36 as amended.

Regarding the claimed “an object beam unit, including a removable band-limited diffuser,” the Examiner continues to refer to frosted screen 44 of Newswanger ‘449. The applicants respectfully submit that Newswanger’s frosted screen 44: (1) is not a “band-limited” diffuser; (2) does not include “a deterministic phase pattern designed to diffuse light in at least one of a specific pattern and a specific direction”; and (3) is not “designed for a wavelength corresponding to a wavelength of the coherent beam.”

In his Final Office Action of September 4, 2003, p. 5, ¶5, the Examiner states:

[I]t is noted that, strictly speaking, said diffuser taught by Newswanger is inherently band-limited, inasmuch as said diffuser would not efficiently pass, for the sake of example, radiation in the infrared or ultraviolet bands

While it is reasonable to conclude that frosted screen 44 is a diffuser, there is nothing in Newswanger ‘449 teaching or suggesting that it is “band-limited” within the meaning of the term as known to those having ordinary skill in the art. The Examiner’s conclusion as to the meaning of the term “band-limited” renders the term meaningless in the claim and is contrary to the meaning of the term as presented in the applicants’ specification. Moreover, the Examiner’s reliance on a purported inherent property of frosted screen 44 carries with it an obligation as noted in MPEP § 2112:

“In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original)

The applicants respectfully submit that the Examiner has provided no such evidence or rationale tending to show inherency.

Regarding the claim requirement that the band-limited diffuser include “a deterministic phase pattern designed to diffuse light in at least one of a specific pattern and a specific direction,” the Examiner merely refers to frosted screen 44, but provides no argument as to why frosted screen 44 includes the claimed features. Final Office Action of September 4, 2003, p. 3, ¶7. The applicants respectfully submit that nothing in Newswanger ‘449 teaches or suggests this limitation. Regarding the claim requirement that the band-limited diffuser is “designed for a wavelength corresponding to a wavelength of the coherent beam,” the Examiner merely suggests that it is “inherent.” Final Office Action of September 4, 2003, p. 6, ¶3. The applicant respectfully disagrees and reiterates the requirements for relying on a purported inherent property as described above.

Although the Examiner has not had the opportunity to address the claim limitation that “the removable band-limited diffuser and the removable masking plate form a matched set configured to allow exposure of a particular size hogel,” the Examiner has stated that:

With regard to removability of said masking plate, it is asserted that it would have been obvious . . . to have modified the invention of Newswanger [‘449] such that the masking plate is removable (Final Office Action of September 4, 2003, p. 6, ¶2).

Moreover, regarding the relationship between the masking plate and the diffuser as stated in claim 64, the Examiner refers to column 4, lines 33-57 of Newswanger ‘449 which discuss, *inter alia*, moving a slit within mask 52 and/or the mask itself. Final Office Action of September 4, 2003, p. 6, ¶4. The applicants respectfully submit that Newswanger does not teach or suggest *a removable* mask, e.g., for the purpose of changing masks, or that a removable mask have the claimed relationship with the diffuser in order to allow exposure of a particular size hogel.

The importance of removability generally, the importance of the relationship between the removable masking plate and the removable diffuser, and the deficiencies of the prior art are made evident in the applicants’ specification:

Because the required matching of a object beam 20, a band-limited diffuser 45, and reference beam masking plate 65 to the size of a desired elemental hologram, it has been difficult to change the sizes of elemental

holograms exposed by a hologram printer. Because of this lack of flexibility, prior art printers cannot easily print holograms having different sizes of elemental holograms, and are restricted to printing holograms with single, fixed-sized elemental holograms. (Specification, p. 6, lines 27-27)

In addition, pages 29-30 of the specification discuss in detail the use of related removable masking plate / removable diffuser pairs. Such devices are neither taught nor suggested by Newswanger '449 and are not inherently known.

With respect to the claimed "a computer programmed to control the interference of the object beam and the reference beam and the delivery of the rendered image to the object beam unit," the Examiner refers to column 6, lines 41-44 of Newswanger which state in relevant part:

2. The holographic stereogram display of claim 1 wherein the plurality of image pairs are of related subject matter, whereby displaying said image pairs in a sequence controlled by the control of said light sources will create an animated holographic stereogram display. (Column 6, lines 42-46)

While Newswanger may teach displaying image pairs (as part of a holographic *display*) in a sequence controlled by the control of the light sources used, he does not teach or suggest a *computer programmed to control the interference of the object beam and the reference beam and the delivery of the rendered image to the object beam unit*.

The Examiner also refers to "computer 46 in Figs. 3-6; entire document" of Newswanger '317 as teaching the programmed computer limitations. Final Office Action of September 4, 2003, p. 7, ¶1. The applicants respectfully disagree. Computer 46 is used for a variety of functions, e.g., controlling shutters, table position, diffraction grating rotation, etc., but no where does Newswanger '317 teach or suggest using computer 46 for "the delivery of the rendered image to the object beam unit."

Accordingly, the applicants respectfully submit that independent claim 36 is allowable over Newswanger '449 and '317 taken alone or in combination. Claims 37, 38, and 64 depend from claim 36 and are allowable for at least this reason.

Newswanger neither teaches nor suggests an apparatus for printing holographic stereograms including:

a voxel-control lens located in the path of the object beam and proximate to the holographic recording material, *the voxel control lens being capable of varying the size of at least one voxel and being capable of making the rendered image displayed by the object beam unit as seen from the viewpoint of an elemental hologram appear at a greater apparent distance relative to the holographic recording material; and*

a computer programmed to control the interference of the object beam and the reference beam and the delivery of the rendered image to the object beam unit,

as required by independent claim 39 and generally required (i.e., the voxel-control lens) by independent claim 57.

Regarding the claimed “voxel-control lens,” the Examiner refers to Newswanger ‘449s lens **46**. The applicants respectfully submit that Newswanger’s lens **46** is not a *voxel-control* lens being capable of varying the size of at least one voxel and being capable of making the rendered image displayed by the object beam unit as seen from the viewpoint of an elemental hologram appear at a greater apparent distance relative to the holographic recording material.

The Examiner repeatedly relies on so-called “inherent” properties of Newswanger ‘449s lens **46**, but has provided no evidence or rationale tending to show inherency, as required (see above). Moreover, the applicants reiterate their position (described above) that Newswanger ‘449 and ‘317 neither teach nor suggest the claimed computer programmed to control the “delivery of the rendered image to the object beam unit.”

Accordingly, the applicants respectfully submit that independent claims 36, 39 and 57 are allowable over Newswanger ‘449 and ‘317 taken alone or in combination.

Claims 37, 38, and 64 depend from claim 36 and are allowable for at least this reason.

Claims 40 and 41 depend from claim 39 and are allowable for at least this reason.

In view of the amendments and remarks set forth herein, the application is believed to be in condition for allowance and a notice to that effect is solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the examiner is requested to telephone the undersigned.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA, 22313-1450, on

Dec 4, 2003.


Attorney for Applicant(s)

12/4/03
Date of Signature

Respectfully submitted,



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